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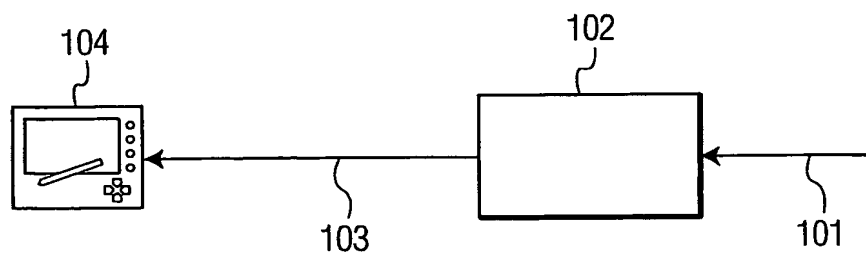


FIG. 1A

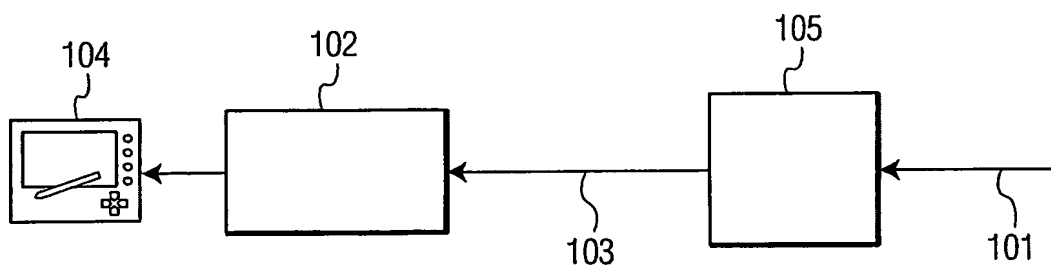


FIG. 1B

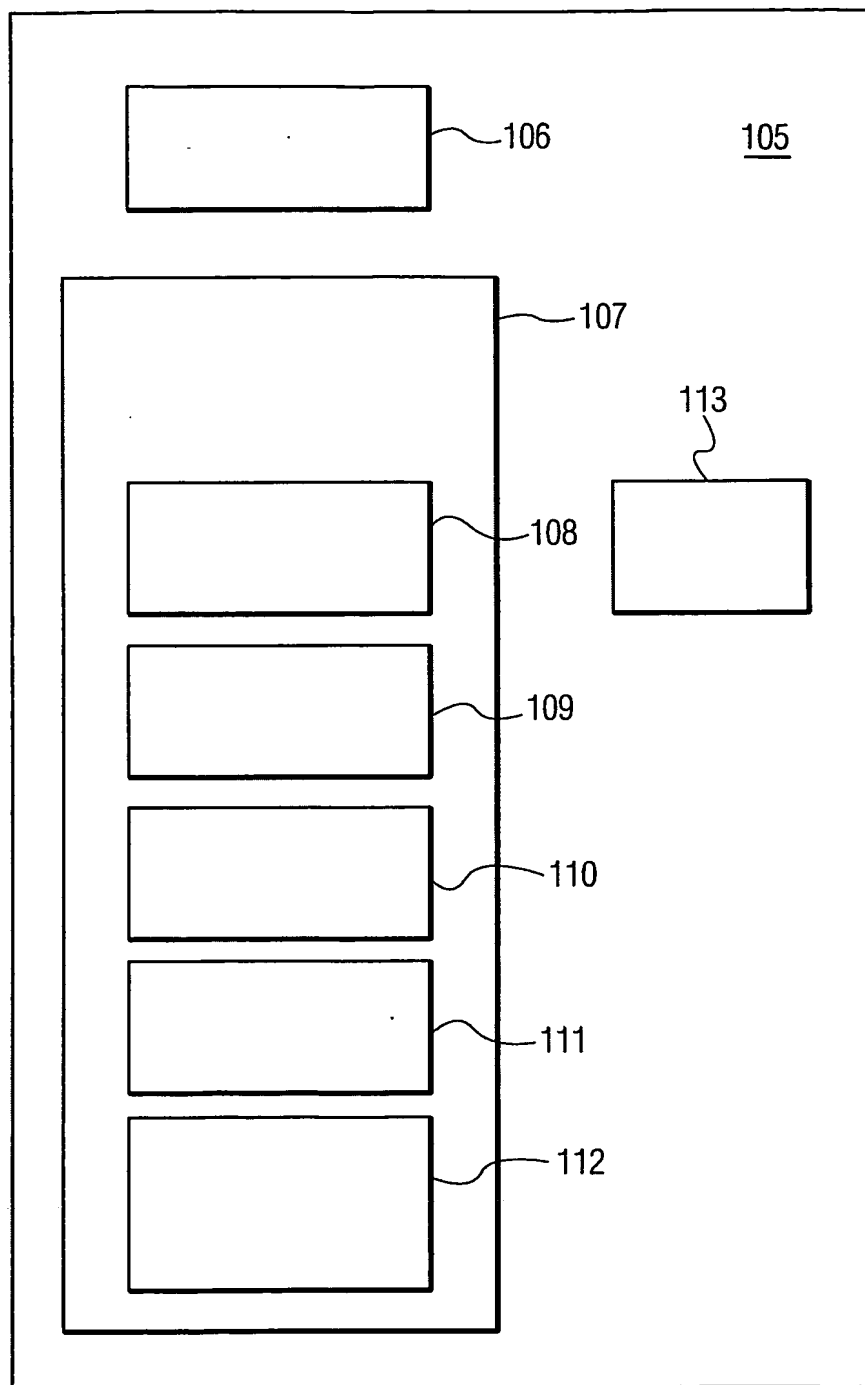


FIG. 1C



FIG. 2



FIG. 3



FIG. 4



FIG. 5



FIG. 6



FIG. 7



FIG. 8



FIG. 9



FIG. 10



FIG. 11



FIG. 12



FIG. 13

% Assume input image is $0 < (R,G,B) < 1$

% Constants

MIN = 0 (typically 0 or 16/255)
 MAX = 1 (typically 1 or 235/255)

IMAXFAC = $g(A1, A2)$ (reduce overall brightness, depends on input gamut and display gamut, e.g. 0.85)

% Effect size (larger with larger values of R,G,B)
 ALPHA = $f(R,G,B)$ (e.g. $\max(R,G,B)$ or $\sqrt{R^2+G^2+B^2}$, or $c_1R+c_2G+c_3B$)

% Reduce overall brightness

$(R,G,B) = (R,G,B) * IMAXFAC$

% Gamma correction (go to linear color domain, this
 % can be omitted for simplification, to reduce the
 % number of operations, but the color transformations
 % are no longer very accurate)
 $(R,G,B) = (R,G,B)^{GAMMA}$

% Gamut correction (expansion)

$(R,G,B) = \text{inv}(A2) * A1 * (R,G,B)$

% Clipping values < MIN if any((R,G,B)<MIN), Subtract
 % minimum multiplied with certain factor depending on
 % intensity
 $(R,G,B) = (R,G,B) + ALPHA * (MIN - \min(R,G,B,MIN))$
 end

% Clipping values > MAX if any((R,G,B)>MAX),

% Scale RGB vector within maximum
 $(R,G,B) = (R,G,B) * (MAX / \max(R,G,B,MAX))$
 end

% Inverse gamma correction, if needed

$(R,G,B) = (R,G,B)^{(1/GAMMA)}$

FIG. 14

% Assume input image is $0 < (R,G,B) < 1$

% Constants

MIN = 0 (typically 0 or 16/255)

MAX = 1 (typically 1 or 235/255)

IMAXFAC = g(A1,A2) (reduce overall brightness, depends on input gamut and display gamut, e.g. 0.85)

% Effect size (larger with larger values of R,G,B)

ALPHA = f(R,G,B) (e.g. $\max(R,G,B)$ or $\sqrt{R^2+G^2+B^2}$, or $c_1R+c_2G+c_3B$)

% Reduce overall brightness

—— $(R,G,B) = (R,G,B) * IMAXFAC$

$(R,G,B) = (R,G,B) * F(S)$;

% Where S is the saturation, that can be calculated from R,G,B

% and F(S) is a function of S that is equal to MAX for S=0 and

% equal to IMAXFAC for S = some (constant) value between 0 and

% the maximum saturation of the primary colors. The function F

% can be any continuously decreasing function, e.g. linear or

% \cos^2 . For the example below S=0.75 is the cut-off

% saturation for which F(S) is IMAXFAC.

% Gamma correction (go to linear color domain, this can be

% omitted for simplification, to reduce the number of

% operations, but the color transformations are no longer very

% accurate)

$(R,G,B) = (R,G,B)^{GAMMA}$

% Gamut correction (expansion)

$(R,G,B) = \text{inv}(A2) * A1 * (R,G,B)$

% Clipping values < MIN if any((R,G,B)<MIN),

% Subtract minimum multiplied with certain factor depending on

% intensity

$(R,G,B) = 13R,G,B) + ALPHA * (MIN - \min(R,G,B,MIN))$

end

% Clipping values > MAX if any((R,G,B)>MAX),

% Scale RGB vector within maximum

$(R,G,B) = (R,G,B) * (MAX/\max(R,G,B,MAX))$

end

% Inverse gamma correction if needed

$(R,G,B) = (R,G,B)^{(1/GAMMA)}$

% Output image is between: $MIN < (R,G,B) < MAX$

FIG. 15



FIG. 16A



FIG. 16B

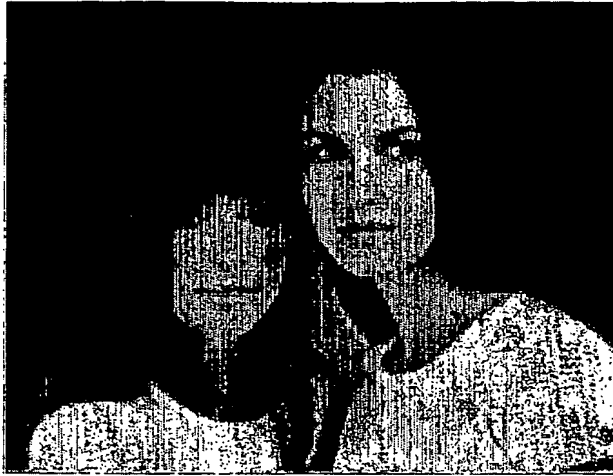


FIG. 16C



FIG. 16D

```

% Assume input image is 0<(R,G,B)<1
% Constants
MIN = 0           (typically 0 or 16/255)
MAX = 1           (typically 1 or 235/255)
IMAXFAC = g(A1,A2) (reduce overall brightness, depends on input gamut and display gamut, e.g. 0.85)

% Effect size (larger with larger values of R,G,B)
ALPHA = f(R,G,B)  (e.g. max(R,G,B) or  $\sqrt{R^2+G^2+B^2}$ , or  $c1R+c2G+c3B$ )

% Reduce overall brightness
(X) [0.4306 0.3415 0.1784] (R)
(Y) [0.2220 0.7067 0.0713] * (G)
(Z) [0.0202 0.1296 0.9393] (B)

u' = 4*X/(X + 15*Y + 3*Z)
v' = 9*Y/(X + 15*Y + 3*Z)

S = 13*sqrt((u'-0.1978).^2+(v'-0.4683).^2);
SCUT = 0.75;
if S>SCUT,
    F = IMAXFAC;
else
    F = (((1+cos(S/SCUT*pi))/2).^2)*(1-IMAXFAC) + IMAXFAC;
end
(R,G,B) = (R,G,B)*F;
% Where S is the saturation, that can be calculated from R,G,B
% and F(S) is a function of S that is equal to MAX for S=0 and
% equal to IMAXFAC for S = some (constant) value between 0 and
% the maximum saturation of the primary colors. The function F
% can be any continuously decreasing function, e.g. linear or
%  $\cos^2$ . For the example below S=0.75 is the cut-off
% saturation for which F(S) is IMAXFAC.

% Gamma correction (go to linear color domain, this can be
% omitted for simplification, to reduce the number of
% operations, but the color transformations are no longer very
% accurate)
(R,G,B) = (R,G,B)^GAMMA
% Gamut correction (expansion)
(R,G,B) = inv(A2) * A1 * (R,G,B)
% Clipping values < MIN if any((R,G,B)<MIN),
% Subtract minimum multiplied with certain factor depending on
% intensity
(R,G,B) = (R,G,B) + ALPHA*(MIN - min(R,G,B,MIN))
end
% Clipping values > MAX if any((R,G,B)>MAX),
% Scale RGB vector within maximum
(R,G,B) = (R,G,B) * (MAX/max(R,G,B,MAX))
end
% Inverse gamma correction if needed
(R,G,B) = (R,G,B)^(1/GAMMA)
% Output image is between: MIN<(R,G,B)<MAX

```

FIG. 17

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